Public Health
Seattle & King County
HEALTHY PEOPLE. HEALTHY COMMUNITIES.

Alonzo L. Plough, Ph.D., MPH, *Director and Health Officer*

West Nile Virus (WNV) Update for Health Care Providers - June, 2004
Laboratory Testing & Case Reporting Guidelines

West Nile virus (WNV) is a flavivirus related to Japanese encephalitis and St. Louis encephalitis (SLE) viruses. WNV can affect humans, horses, birds, and other vertebrates. The clinical presentation cannot reliably be distinguished from other causes of viral encephalitis. In fall 2002, WNV was detected in a crow, a raven, and two horses in Washington State. There is currently significant WNV activity in California and the disease may occur locally this summer. The following information summarizes clinical manifestations, diagnosis and laboratory testing, and reporting for WNV infections in King County.

WNV is transmitted by the bite of one of a number of mosquito species (primarily *Culex* species in Washington) that become infected after feeding on birds carrying WNV. WNV is not transmitted person-to-person or to humans directly from dead or living animals other than mosquitoes. In 2002, transfusion of blood products and organ transplantation were identified as potential routes of infection with WNV, and single cases of transplacental and breast-milk transmission infection were reported.

Clinical presentations: WNV infection should be considered in persons of all ages (particularly May – November) with *unexplained* encephalitis, aseptic meningitis, acute flaccid paralysis or presumed Guillain-Barre Syndrome, or other neurological presentations described below. Because WNV transmission can occur year-round in some areas, obtaining a recent travel history is always important.

Most WNV infections are mild or asymptomatic. Approximately 20% of infected persons develop **West Nile fever**, a less severe form of infection. The incubation period is thought to range from 3 to 14 days and symptoms last 3-6 days or longer. Symptoms of West Nile fever may include fever, malaise, anorexia, nausea, vomiting, eye pain, headache, body aches, skin rash, and swollen lymph glands.

Approximately 1 in 150 infections cause the more severe **neurological forms of disease** including **encephalitis** and **meningitis**. Neuroinvasive disease is associated with a range of neurologic and systemic manifestations including headache, high fever, gastrointestinal symptoms, neck stiffness, stupor, disorientation, cranial nerve abnormalities, ataxia, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death. Case-fatality rates for hospitalized patients range from 3% to 15% and are highest in the elderly. Neuromuscular weakness in persons with a viral meningoencephalitis syndrome is suggestive of WNV infection. Other neurological presentations include **acute flaccid paralysis** (which may present without meningitis or encephalitis), ataxia and extrapyramidal signs, tremor and Parkinson-like syndrome, cranial nerve abnormalities, myelitis, optic neuritis, polyradiculitis, and seizures.

There is no vaccine or specific therapy for WNV in humans. In severe cases, intensive supportive therapy is indicated including hospitalization, intravenous (IV) fluids, airway management, respiratory support, prevention of secondary infections and good nursing care.

Communicable Disease Control, Epidemiology & Immunization Section
999 Third Avenue, Suite 900 • Seattle, WA 98104-4039
T (206) 296-4774 **F** (206) 296-4803 • www.metrokc.gov/health

City of Seattle
Gregory J. Nickels, *Mayor*
King County
Ron Sims, *Executive*

Report WNV cases to Public Health at 206-296-4774 within 3 work days. **Case report forms are available online at:** http://www.metrokc.gov/health/westnile/index.htm **and by calling 206-296-4774.**

Healthcare providers & facilities should report patients with any of the following:

1) **Viral encephalitis**, a clinical diagnosis characterized by:
   a) Fever ≥38°C or 100°F and
   b) CNS signs may include altered mental status (altered level of consciousness, confusion, agitation, or lethargy), coma, or other cortical signs (cranial nerve palsies; paresis or paralysis, or seizures), and
   c) Abnormal CSF profile suggestive of viral etiology: a negative bacterial stain and culture, CSF pleocytosis and/or moderately elevated protein

2) **Aseptic meningitis** occurring May through November in any patient ≥18 years of age, characterized by:
   a) fever ≥38°C or 100°F and
   b) signs of meningeal inflammation (stiff neck, headache, photophobia) and
   c) abnormal CSF profile suggestive of viral etiology: a negative bacterial stain and culture, CSF pleocytosis, and/or moderately elevated protein

3) **Acute flaccid paralysis or presumed Guillain-Barre syndrome** even in the absence of fever and other neurologic symptoms.

4) **Suspected West Nile virus infection in patients with potential recent blood donation or transfusion histories, organ transplant recipients, laboratory or occupational exposures, pregnant women, and transplacental or breast-feeding associated exposures**. When taking a history from a suspected WNV patient, determine if the patient received blood transfusions or organs within the 4 weeks preceding symptom onset (if so, serum or tissue samples should be retained for testing). In addition, please ask about and report any history of blood or organ donation within 2 weeks of symptom onset for persons with suspected WNV infection. Prompt reporting of these cases will facilitate follow-up including withdrawal of potentially infected blood components.

5) **West Nile fever patients** with positive commercial laboratory test results (WA PHL will confirm such results during the initial stages of an outbreak. Subsequent reports will be accepted without confirmation by the WA PHL).

Additional Information on WNV is available at:
CDC WNV web site: http://www.cdc.gov/ncidod/dvbid/westnile/index.htm
Public Health – Seattle & King County WNV web site: http://www.metrokc.gov/health/westnile/
Washington State Department of Health WNV web site: http://www.doh.wa.gov/ehp/ts/Zoo/WNV/WNV.html

Laboratory Testing for WNV – June 2004

The most efficient diagnostic method is detection of IgM antibody to WNV in *serum collected 8-14 days after illness onset* or *cerebral spinal fluid (CSF) collected within 8 days of illness onset* using the IgM antibody capture enzyme-linked immunosorbent assay (MAC-ELISA). ELISA testing is available for *hospitalized patients* after reporting to Public Health through the Washington State Public Health Laboratories (WA PHL). Commercial laboratory testing is available to diagnose patients with suspected West Nile fever.

- **Please note: Testing at the WA PHL can be arranged *only* after reporting and consultation with Public Health – Seattle & King County: WA PHL will not test specimens without a completed case report from Public Health. Case report forms are available online at:** http://www.metrokc.gov/health/westnile/index.htm **and by calling 206-296-4774.**

- **Submit 1 cc of CSF and/or separated serum** (not whole blood) for ELISA testing
  - If acute sera and/or CSF specimens are negative, submit convalescent serum 2-4 weeks after the acute specimen.
  - Specimens should be refrigerated and transported cold. Frozen CSF is acceptable.

- **Specimens should be submitted with a completed WSDOH PHL *Virus Examinations* form** (available online at http://www.metrokc.gov/health/westnile/index.htm) **to the Public Health - Seattle & King County Laboratory, 325 9th Ave, Box 359973, Seattle, WA 98104-2499 (telephone, 206-731-8950)**.

WNV cannot be distinguished from other causes of meningoencephalitis on clinical grounds. Testing for other common causes of aseptic meningitis/encephalitis syndrome is encouraged, including culture and/or PCR testing for enteroviruses and herpes viruses. (See: Olin, et al. Aseptic meningitis epidemic during a West Nile virus avian epizootic. Emerg Infect Dis, 2003;9:1082-1088, available at: http://www.cdc.gov/ncidod/EID/vol9no9/03-0068.htm)

Test Interpretation: IgM antibody develops by day 8 and IgG antibody within 3 weeks after illness onset. When indicated, convalescent serum specimens should be drawn about 3-4 weeks after acute specimens. **Negative results on any specimen obtained <8 days after onset of illness should be considered inconclusive and a convalescent serum specimen, obtained at least 2 weeks after the first specimen, will be needed to make a final determination**. Cross-reactions may occur among patients who have had yellow fever or Japanese encephalitis vaccination, or a previous history of arboviral encephalitis or dengue fever.